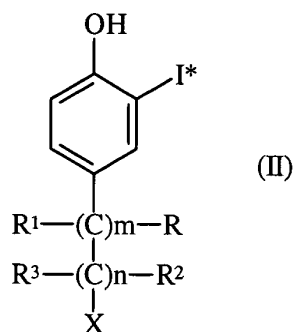


WHAT IS CLAIMED IS:

1. A pharmaceutical formulation comprising as an active ingredient a radioiodinated compound of the formula



wherein: m and n are independently 0, 1, 2 or 3, X is a group that is negatively or positively charged at physiological pH, R, R¹, R² and R³ are independently hydrogen, C₁-C₄ alkyl, or a carboxyl group, and I* is ¹²³I, ¹³¹I or ¹²⁵I, and its pharmaceutically-acceptable salts, with a pharmaceutically-acceptable carrier, having less than about 15% of unbound iodine present.

2. The formulation of Claim 1 wherein the X group of the formula is sulfonates, primary amines, substituted amines which may be secondary, tertiary, or quaternary.
3. The formulation of Claim 2 wherein the X group of the formula is a sulfonate.
4. The formulation of Claim 1 wherein the formula groups m and n are 0, R, R¹, R², and R³ are hydrogen, and X is a sulfonate, as its pharmaceutically-acceptable salt.
5. The formulation of Claim 4 which has as its active ingredient a compound that is sodium 3-iodo-4-hydroxybenzenesulfonate.
6. The formulation of Claim 1 wherein the formula groups m and n are both 1, R, R¹ and R³ are hydrogen, R² is a carboxyl group, and X is an amine as its pharmaceutically-acceptable salt.

7. The formulation of Claim 6 which has as its active ingredient a compound that is iodo-tyrosine as the chloride salt.

8. The formulation of Claim 1 wherein the formula groups m and n are both 1, R, R¹, R² and R³ are hydrogen, and X is an amine as its pharmaceutically-acceptable salt.

9. The formulation of Claim 8 which has as its active ingredient a compound that is iodo-tyramine as the chloride salt.

10. The formulation of Claim 1 where the formula term I* is ¹²⁵I.

11. The formulation of Claim 1 wherein the formulation has as its pharmaceutically-acceptable carrier water that is buffered to physiological pH.

12. The formulation of Claim 11 wherein the buffer is HEPES and the pH is from 6 to 8.

13. The formulation of Claim 11 or 12 wherein a radiolytic protectant is present.

14. The formulation of Claim 13 wherein the radiolytic protectant is one or more of benzyl alcohol, ascorbic acid, gentisic acid, cysteine, butylated hydroxytoluene (BHT), citric acid, human serum albumin (HSA), glycerol, cysteamine, sulfarex, glutathione, tryptophan, and iodoacetamide.

15. The formulation of Claim 14 wherein the radiolytic protectant is the sodium salt of ascorbic acid.

16. The formulation of Claim 5 wherein the iodo atom is ¹²⁵I, having as pharmaceutically-acceptable carriers HEPES and acetate buffers, with a radiolytic protectant of ascorbic acid.

17. The formulation of Claim 1 wherein less than 10% of unbound iodine is present in the formulation.

10022385-121801